



STIC Search Report

EIC 1700

STIC Database Tracking Number: 155536

TO: Christina Ildebrando

Location: 6C61

Art Unit : 1725

June 20, 2005

Case Serial Number: 10/675141

From: Kathleen Fuller

Location: EIC 1700

REMSEN 4B28

Phone: 571/272-2505

Kathleen.Fuller@uspto.gov

Search Notes

The funtionalized silicates are not structurally searchable –much too broad description of them. Therefore I searched using the starting materials in the application as indexed by CA and in the claims and combined this with “funtionalized zeolite”. If you have questions please call me.



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- I am an examiner in Workgroup: Example: 1713
➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

- Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

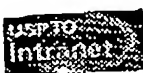
Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

STIC CDB Search Request Form

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Search requests relating to published applications, patent families, and litigation may be submitted by filling out this form and clicking on "Send."

For all other search requests, fill out the form, print, and submit the printout with any attachments to the STIC facility serving your Technology Center.

Tech Center:

☐ TC 1600 ☒ TC 1700 ☐ TC 2100 ☐ TC 2600 ☐ TC 2800
☐ TC2900 ☐ TC 3600 ☐ TC 3700 ☐ Law Lib ☐ Other

Enter your Contact Information below:

Name: Christina Johnson

Employee Number: 77266

Phone: 571-272-1176

Art Unit or Office: 1725

Building & Room Number: REM 6C-61

Enter the case serial number (Required): 10/675141

If not related to a patent application, please enter NA here.

Class / Subclass(es) 502/60, 62, 64, 71, 77, 78, 79

Earliest Priority Filing Date: 9/30/03

Format preferred for results:

☒ Paper ☐ Diskette ☐ E-mail

Provide detailed information on your search topic:

- In your own words, describe in detail the concepts or subjects you want us to search.
- Include synonyms, keywords, and acronyms. Define terms that have special meanings.
- *For Chemical Structure Searches Only*
Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers
- *For Sequence Searches Only*

Best Available Copy

SCIENTIFIC REFERENCE BR
Sci & Tech Inf - Cntr

JUN 6 RECD

Pat. & T.M. Office

2/14

6/4/05

Include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

- "For Foreign Patent Family Searches Only"
Include the country name and patent number.
- Provide examples or give us relevant citations, authors, etc., if known.
- FAX or send the **abstract, pertinent claims** (not all of the claims), **drawings, or chemical structures** to your EIC or branch library.

Enter your Search Topic Information below:

Please search the structural units, formulae, and compounds detailed in claims 1-36 in combination with a zeolite. Applicant is claiming a functionalized zeolite and not the compounds per se. Attached are the claims and abstract.

Special Instructions and Other Comments:

(For fastest service, let us know the best times to contact you, in case the searcher needs further clarification on your search.)

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* available and contains the CA role and document type information. *
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<http://www.cas.org/ONLINE/DBSS/registryss.html>

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L2 69 SEA FILE=REGISTRY ABB=ON (102-04-5/BI OR 105-67-9/BI OR 106-44-5/BI OR 106-48-9/BI OR 106-51-4/BI OR 108-10-1/BI OR 108-39-4/BI OR 108-43-0/BI OR 108-94-1/BI OR 108-95-2/BI OR 1119-94-4/BI OR 119-61-9/BI OR 1197-34-8/BI OR 120-92-3/BI OR 12026-57-2/BI OR 12027-12-2/BI OR 12027-38-2/BI OR 123-54-6/BI OR 128-39-2/BI OR 13242-21-2/BI OR 1343-93-7/BI OR 135-19-3/BI OR 150-19-6/BI OR 1687-64-5/BI OR 18267-08-8/BI OR 2269-22-9/BI OR 23519-77-9/BI OR 2416-94-6/BI OR 2417-10-9/BI OR 28469-78-5/BI OR 28994-41-4/BI OR 3085-30-1/BI OR 367-12-4/BI OR 4073-85-2/BI OR 4420-74-0/BI OR 486-25-9/BI OR 497-38-1/BI OR 527-35-5/BI OR 555-31-7/BI OR 555-75-9/BI OR 556-91-2/BI OR 563-80-4/BI OR 57-09-0/BI OR 576-26-1/BI OR 611-99-4/BI OR 67-64-1/BI OR 70942-24-4/BI OR 75-59-2/BI OR 7631-86-9/BI OR 78-10-4/BI OR 78-93-3/BI OR 79059-66-8/BI OR 80-05-7/BI OR 82-86-0/BI OR 83-33-0/BI OR 84-65-1/BI OR 865-31-6/BI OR 87-65-0/BI OR 873-94-9/BI OR 88-18-6/BI OR 90-15-3/BI OR 90-43-7/BI OR 93-55-0/BI OR 95-48-7/BI OR 95-56-7/BI OR 95-57-8/BI OR 96-22-0/BI OR 98-86-2/BI OR 99-93-4/BI)

L6 48 SEA FILE=REGISTRY ABB=ON ZEOLITE

L9 109703 SEA FILE=HCAPLUS ABB=ON L6 OR ?ZEOLITE?

L10 24998 SEA FILE=REGISTRY ABB=ON SILICATE

L11 158012 SEA FILE=HCAPLUS ABB=ON L10

L20 251 SEA FILE=HCAPLUS ABB=ON (L11 OR L9) (5A) FUNCTIONALI?

L21 162 SEA FILE=HCAPLUS ABB=ON L20 AND ZEOLITE?/IT

L26 22 SEA FILE=REGISTRY ABB=ON L2 AND ONE

L27 42 SEA FILE=REGISTRY ABB=ON L2 AND OL

L28 14 SEA FILE=REGISTRY ABB=ON L27 AND 1-2/SI,AL,ZR,N

L29 28 SEA FILE=REGISTRY ABB=ON L27 NOT L28

L30 23 SEA FILE=REGISTRY ABB=ON L2 NOT (L26 OR L29)

L31 23 SEA FILE=REGISTRY ABB=ON L28 OR L30

L33 4 SEA FILE=REGISTRY ABB=ON L31 AND SILICA?

L34 1 SEA FILE=REGISTRY ABB=ON L33 AND O2SI/MF

L35 22 SEA FILE=REGISTRY ABB=ON L31 NOT L34

L36 2 SEA FILE=REGISTRY ABB=ON L35 AND 1/SI AND SULFONIC

L37 20 SEA FILE=REGISTRY ABB=ON L35 NOT L36

L38 1 SEA FILE=REGISTRY ABB=ON "TETRAETHYL ORTHOTITANATE"/CN

L39 1 SEA FILE=REGISTRY ABB=ON "TETRAMETHYL ORTHOTITANATE"/CN

L40 1 SEA FILE=REGISTRY ABB=ON "TETRAISOPROPYL ORTHOTITANATE"/CN

L47 4 SEA FILE=REGISTRY ABB=ON C3H8O.1/3AL/MF

L48 2 SEA FILE=REGISTRY ABB=ON CH4O.1/3AL/MF

L49 1 SEA FILE=REGISTRY ABB=ON C2H6O.1/3AL/MF

L50 6 SEA FILE=REGISTRY ABB=ON C4H10O.1/3AL/MF

L51 5 SEA FILE=REGISTRY ABB=ON C4H10O.1/4ZR/MF

L52 1 SEA FILE=REGISTRY ABB=ON C2H6O.1/4ZR/MF

L53 1 SEA FILE=REGISTRY ABB=ON CH4O.1/4ZR/MF

L54 1 SEA FILE=REGISTRY ABB=ON C2H6O.1/4ZR/MF

L56 1 SEA FILE=REGISTRY ABB=ON C6H6O.1/4ZR/MF

L57 24 SEA FILE=REGISTRY ABB=ON (L38 OR L39 OR L40) OR (L47 OR L48 OR L49 OR L50 OR L51 OR L52 OR L53 OR L54) OR L56

L58 4 SEA FILE=HCAPLUS ABB=ON L21 AND L57

L59 1 SEA FILE=HCAPLUS ABB=ON L21 AND L36

L60 52473 SEA FILE=HCAPLUS ABB=ON L37

L63 22 SEA FILE=HCAPLUS ABB=ON L60 (L) FUNCTIONAL? (L) ZEOLITE?

L64 24 SEA FILE=HCAPLUS ABB=ON L58 OR L59 OR L63

=> D L64 BIB ABS IND HITSTR 1-24

L64 ANSWER 1 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

KATHLEEN FULLER EIC 1700 REMSON 4B28 571/272-2505

AN 2005:284113 HCAPLUS

DN 142:336779

TI **Functionalized zeolite compositions, their preparation and use**

IN Kishan, Gurram; Vetrivel, Rajappan; Kukalyekar, Nileshekumar Prakash; Dhalla, Adil Minoo; Male, Jonathan L.; Spivack, James L.; Ramaswamy, Arumugamangalam Venkataraman; Singh, Anand Pal

PA India

SO U.S. Pat. Appl. Publ., 15 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

Applicant

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005070423	A1	20050331	<u>US 2003-675141</u>	20030930
	WO 2005035119	A2	20050421	WO 2004-US24560	20040729
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

PRAI US 2003-675141 A 20030930

AB Zeolite compns. comprise structural units of silicate, R1SB modified silicate, and R2O3SC modified silicate, where B and C are spacer groups comprising C2 to C20 hydrocarbyl groups; R1 and R2 = alkali metal, H, or C1-20 alkyl groups. The zeolite compns. further comprise structural units derived from a heteropolyacid compound (M3)3(M4)(M5)12O40; where M3 = H or an alkali metal; M4 = P or Si, and M5 = W or Mo. Zeolite treated with tetra-Et orthosilicate and (3-mercaptopropyl)trimethoxysilane and cetyltrimethylammonium bromide resulted in selectivity to bisphenol A (96%), in phenol/acetone condensation. The zeolite compns. are useful as catalysts for producing bisphenols.

IC ICM B01J029-04

INCL 502064000

CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67ST mercapto sulfonic **functionalized zeolite catalyst**
bisphenol A manufIT Condensation reaction catalysts
(**functionalized zeolite catalyst compns. for**
bisphenol manufacture)IT Chabazite-type zeolites
Faujasite-type zeolites
Ferrierite-type zeolites
L zeolites

Mordenite-type zeolites

Zeolite MCM-41

Zeolite ZSM-5

Zeolites (synthetic), uses

RL: CAT (Catalyst use); USES (Uses)

(functionalized zeolite catalyst compns. for
bisphenol manufacture)

IT 80-05-7P, Bisphenol A, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
(functionalized zeolite catalyst compns. for
bisphenol manufacture)

IT 57-09-0, Cetyltrimethylammonium bromide 75-59-2,
Tetramethylammonium hydroxide 78-10-4, Tetraethyl orthosilicate
1119-94-4, Dodecyltrimethylammonium bromide 1343-93-7,
Phosphotungstic acid 4420-74-0, (3-Mercaptopropyl)trimethoxysila
ne 12026-57-2, Phosphomolybdic acid 12027-12-2,
Silicomolybdic acid 12027-38-2, Silicotungstic acid
70942-24-4 79059-66-8

RL: RCT (Reactant); RACT (Reactant or reagent)
(functionalized zeolite catalyst compns. for
bisphenol manufacture)

IT 7631-86-9, SBA-15, uses

RL: CAT (Catalyst use); USES (Uses)
(mesoporous; functionalized zeolite catalyst
compns. for bisphenol manufacture)

IT 67-64-1, Acetone, reactions 78-93-3, Methyl ethyl ketone, reactions
82-86-0, Acenaphthenequinone 83-33-0, Indanone 84-65-1, Anthraquinone
87-65-0, 2,6-Dichlorophenol 88-18-6, 2-tert-Butylphenol 90-15-3,
1-Naphthol 90-43-7, 2-Phenylphenol 93-55-0, Ethyl phenyl ketone
95-48-7, 2-Cresol, reactions 95-56-7, 2-Bromophenol 95-57-8,
2-Chlorophenol 96-22-0, Diethyl ketone 98-86-2, Acetophenone,
reactions 99-93-4 102-04-5, Benzyl ketone 105-67-9,
2,4-Dimethylphenol 106-44-5, 4-Cresol, reactions 106-48-9,
4-Chlorophenol 106-51-4, Quinone, reactions 108-10-1, Methyl isobutyl
ketone 108-39-4, reactions 108-43-0, 3-Chlorophenol 108-94-1,
Cyclohexanone, reactions 108-95-2, Phenol, reactions 119-61-9,
Benzophenone, reactions 120-92-3, Cyclopentanone 123-54-6, Acetyl
acetone, reactions 128-39-2, 2,6-Di-tert-butylphenol 135-19-3,
2-Naphthol, reactions 150-19-6, 3-Methoxyphenol 367-12-4,
2-Fluorophenol 486-25-9, Fluorenone 497-38-1, Bicyclo[2.2.1]heptan-2-
one 527-35-5, 2,3,5,6-Tetramethylphenol 563-80-4, Methyl isopropyl
ketone 576-26-1, 2,6-Xylenol 611-99-4, 4,4'-Dihydroxybenzophenone
873-94-9, 3,3,5-Trimethylcyclohexanone 1197-34-8, 3,5-Diethylphenol
1687-64-5, 2-Ethyl-6-methylphenol 2416-94-6, 2,3,6-Trimethylphenol
2417-10-9, 2-Phenoxyphenol 28994-41-4, 2-Benzylphenol

RL: RCT (Reactant); RACT (Reactant or reagent)
(starting material; functionalized zeolite catalyst
compns. for bisphenol manufacture)

IT 555-31-7, Tri(isopropyl)aluminate 555-75-9
556-91-2 865-31-6 2269-22-9 3085-30-1
4073-85-2 13242-21-2 18267-08-8, Tetraethyl
zirconate 23519-77-9, Tetrapropyl zirconate 28469-78-5

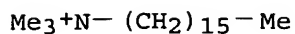
RL: RCT (Reactant); RACT (Reactant or reagent)
(zeolite precursors; functionalized zeolite
catalyst compns. for bisphenol manufacture)

IT 57-09-0, Cetyltrimethylammonium bromide 75-59-2,
Tetramethylammonium hydroxide 78-10-4, Tetraethyl orthosilicate
1119-94-4, Dodecyltrimethylammonium bromide 1343-93-7,
Phosphotungstic acid 4420-74-0, (3-Mercaptopropyl)trimethoxysila
ne 12026-57-2, Phosphomolybdic acid 12027-12-2,
Silicomolybdic acid 12027-38-2, Silicotungstic acid
70942-24-4 79059-66-8

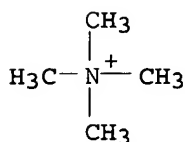
RL: RCT (Reactant); RACT (Reactant or reagent)
(functionalized zeolite catalyst compns. for
bisphenol manufacture)

RN 57-09-0 HCAPLUS

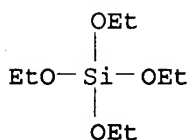
CN 1-Hexadecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)



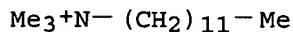
RN 75-59-2 HCAPLUS
CN Methanaminium, N,N,N-trimethyl-, hydroxide (9CI) (CA INDEX NAME)



RN 78-10-4 HCAPLUS
CN Silicic acid (H_4SiO_4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)

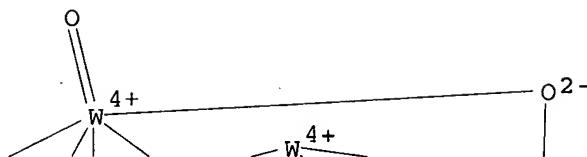


RN 1119-94-4 HCAPLUS
CN 1-Dodecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)

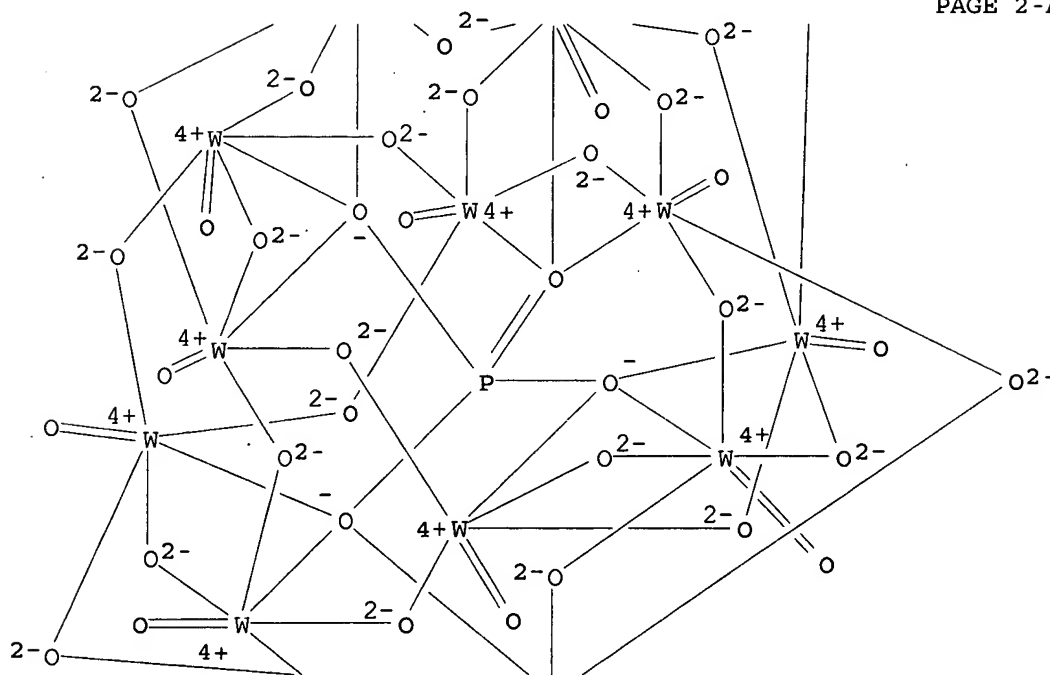


RN 1343-93-7 HCAPLUS
CN Tungstate(3-), tetracosam-oxododecaoxo [μ 12-[phosphato(3-)-
 $\kappa\text{O}:\kappa\text{O}:\kappa\text{O}:\kappa\text{O}':\kappa\text{O}':\kappa\text{O}':\kappa\text{O}''':\kappa$
 $\text{O}''':\kappa\text{O}''':\kappa\text{O}''':\kappa\text{O}''':\kappa\text{O}''']$]dodeca-, trihydrogen
(9CI) (CA INDEX NAME)

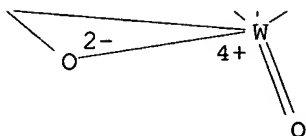
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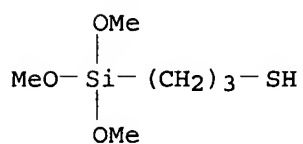


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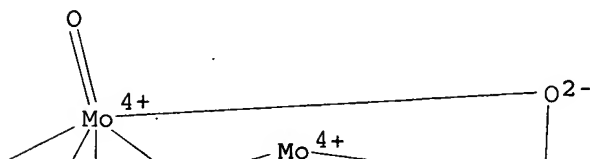
● 3 H⁺

RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)

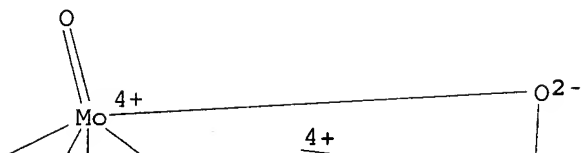


RN 12026-57-2 HCAPLUS
CN Molybdate(3-), tetracosamolybdoxododecaoxo [μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κappa.O'':κO'':κO'':κO'':κO'':κO'']]dodeca-, trihydrogen (9CI) (CA INDEX NAME)

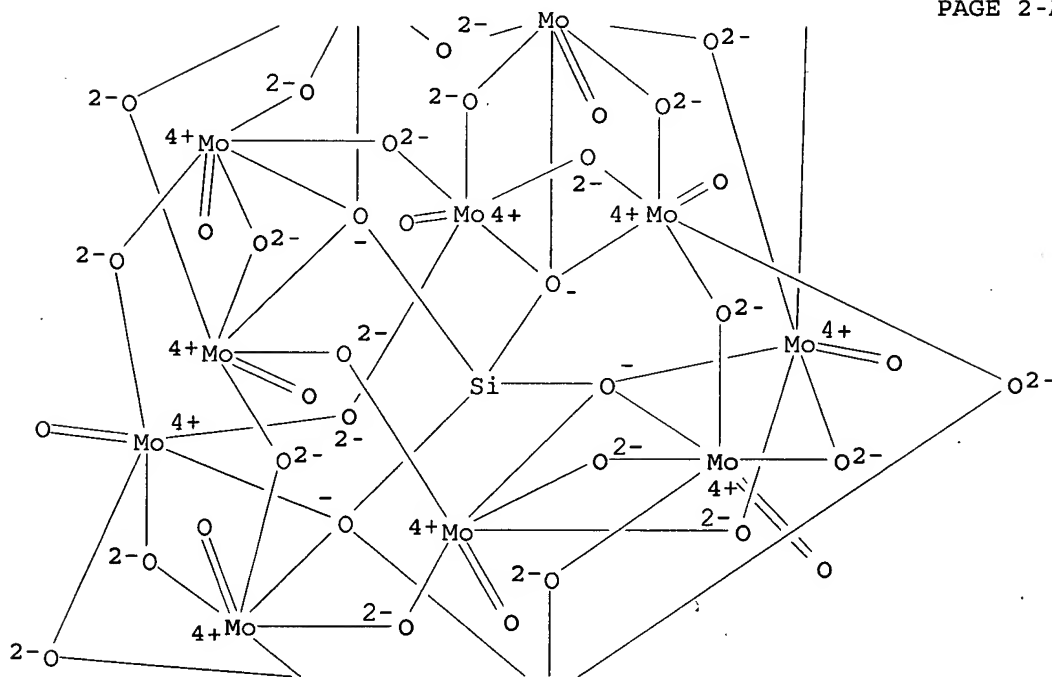
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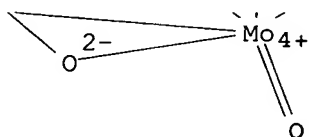
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PAGE 2-A



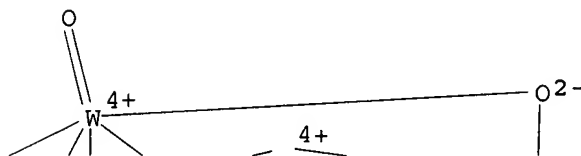
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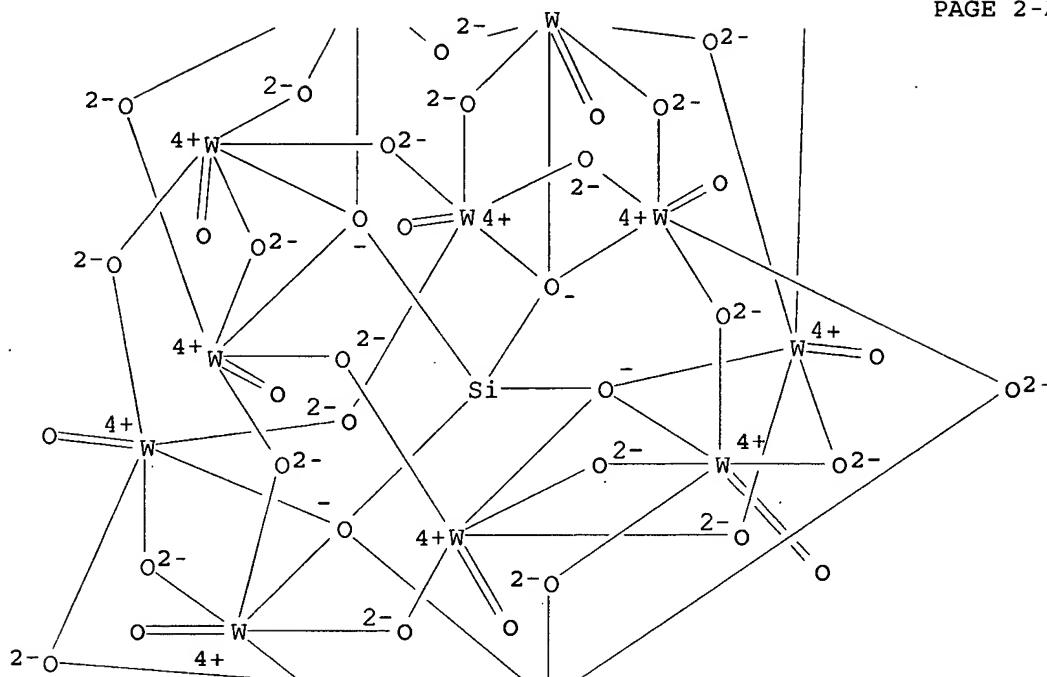
● 4 H⁺

RN 12027-38-2 HCAPLUS
 CN Tungstate(4-), [μ 12-[orthosilicato(4-)- κ O: κ O: κ O:.kapp
 a.O': κ O': κ O': κ O': κ O': κ O': κ O': κ O':.kap
 pa.O': κ O': κ O': κ O': κ O': κ O': κ O': κ O':.tetrahydrogen
 (9CI) (CA INDEX NAME)

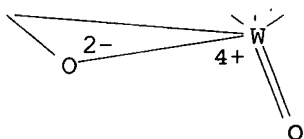
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PAGE 2-A

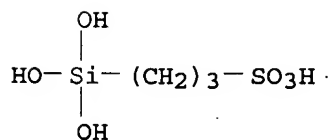


PAGE 3-A

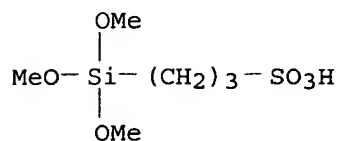


● 4 H⁺

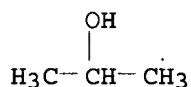
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (9CI) (CA INDEX NAME)



RN 79059-66-8 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)- (9CI) (CA INDEX NAME)

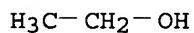


IT 555-31-7, Tri(isopropyl)aluminate 555-75-9
 556-91-2 865-31-6 2269-22-9 3085-30-1
 4073-85-2 13242-21-2 18267-08-8, Tetraethyl
 zirconate 23519-77-9, Tetrapropyl zirconate 28469-78-5
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (zeolite precursors; functionalized zeolite
 catalyst compns. for bisphenol manufacture)
 RN 555-31-7 HCAPLUS
 CN 2-Propanol, aluminum salt (9CI) (CA INDEX NAME)



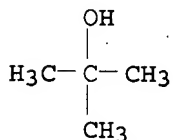
● 1/3 Al

RN 555-75-9 HCAPLUS
 CN Ethanol, aluminum salt (9CI) (CA INDEX NAME)



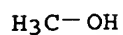
● 1/3 Al

RN 556-91-2 HCAPLUS
 CN 2-Propanol, 2-methyl-, aluminum salt (9CI) (CA INDEX NAME)



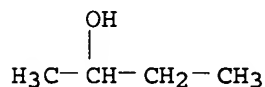
● 1/3 Al

RN 865-31-6 HCAPLUS
 CN Methanol, aluminum salt (8CI, 9CI) (CA INDEX NAME)



●1/3 Al

RN 2269-22-9 HCAPLUS
CN 2-Butanol, aluminum salt (9CI) (CA INDEX NAME)



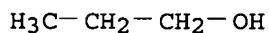
●1/3 Al

RN 3085-30-1 HCAPLUS
CN 1-Butanol, aluminum salt (9CI) (CA INDEX NAME)



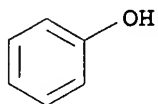
●1/3 Al

RN 4073-85-2 HCAPLUS
CN 1-Propanol, aluminum salt (9CI) (CA INDEX NAME)



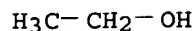
●1/3 Al

RN 13242-21-2 HCAPLUS
CN Phenol, zirconium(4+) salt (8CI, 9CI) (CA INDEX NAME)



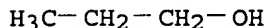
●1/4 Zr(IV)

RN 18267-08-8 HCAPLUS
CN Ethanol, zirconium(4+) salt (9CI) (CA INDEX NAME)



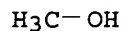
●1/4 Zr(IV)

RN 23519-77-9 HCAPLUS
CN 1-Propanol, zirconium(4+) salt (9CI) (CA INDEX NAME)



●1/4 Zr(IV).

RN 28469-78-5 HCAPLUS
CN Methanol, zirconium(4+) salt (9CI) (CA INDEX NAME)



●1/4 Zr(IV)

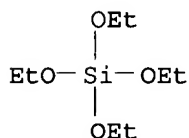
L64 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:127900 HCAPLUS
DN 142:413855
TI Preparation of mesoporous functional zeolites and their use
IN Zhu, Jianhua; Wang, Ying; Wei, Yilun; Xu, Yang; Wang, Yimeng; Wu, Zhengying
PA Nanjing University, Peop. Rep. China
SO Faming Zhuanli Shengqing Gongkai Shuomingshu, 9 pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1460641	A	20031210	CN 2003-131688	20030606
PRAI	CN 2003-131688		20030606		

AB Mesoporous materials based on a silicate mol. sieve containing rare earth or transition metal atoms are prepared having a pore diameter of 4-10 nm, and a base strength of 9.3-22.5. The rare earth or transition metal can be Mg, Ca, Cu, Zn, Fe, Ni, Mo, or Mn. The material is prepared by (1) dissolving rare earth or transition metal oxysalts in water; (2) dissolving P123 in 2M HCl; (3) mixing the solns., adding Et silicate at 25 80°, heating at 80-120°, drying, and calcining at 500-600° to obtain the product. The molar ratio of Et silicate to P123 is 1:0.02. The product can be used as a cigarette additive.

IC ICM C01B039-00
ICS B01J020-18; B01J029-00
CC 49-4 (Industrial Inorganic Chemicals)
Section cross-reference(s): 11

ST mesoporous metal substituted zeolite prepn cigarette additive
 IT Tobacco products
 (cigarettes, additive; preparation of mesoporous functional zeolites and their use)
 IT High-silica zeolites
 RL: CPS (Chemical process); IMF (Industrial manufacture); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
 (metal-substituted; preparation of mesoporous functional zeolites and their use)
 IT 106392-12-5
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (P123, surfactant; preparation of mesoporous functional zeolites and their use)
 IT 78-10-4, TEOS 142-72-3, Magnesium acetate 557-34-6, Zinc acetate 3251-23-8, Cupric nitrate 10103-47-6, Chromium nitrate 10421-48-4, Ferric nitrate
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (preparation of mesoporous functional zeolites and their use)
 IT 78-10-4, TEOS
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (preparation of mesoporous functional zeolites and their use)
 RN 78-10-4 HCAPLUS
 CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



L64 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:672656 HCAPLUS
 DN 142:474725
 TI Synthesis and Characterization of Bifunctional Periodic Silica with Surface and Framework Benzene Functionality
 AU Nie, Chun-Fa; Zhao, Rui; Suo, Ji-Shuan
 CS Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, 730000, Peop. Rep. China
 SO Journal of Porous Materials (2004), 11(3), 141-146
 CODEN: JPMAFX; ISSN: 1380-2224
 PB Kluwer Academic Publishers
 DT Journal
 LA English
 AB Novel organic-inorg. hybrid mesoporous mol. sieve of MCM-41 type containing both
 bridge-bonded Ph groups in the walls and terminally bonded Ph groups protruding into the channel space was synthesized using TEOS, 1,4-bis(triethoxysilyl)benzene (BTESB) and (triethoxysilyl)benzene (TESB) as precursors, N-cetylpyridinium bromide (CPBr) as template under acidic conditions. This new material was characterized by FTIR, PXRD and N adsorption-desorption isotherms. The mesoporous organosilica was in-situ

sulfonylated and reacted with diamines.

CC 78-4 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 66

ST zeolite MCM41 phenyl functionalized prepn sulfonylation diamine reaction;
surface property zeolite MCM41 phenyl functionalized sulfonylated

IT Pore size distribution
Surface area
(of diamine-sulfonylated phenyl-functionalized zeolite MCM-41)

IT Zeolite MCM-41
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation of diamine-sulfonylated phenyl-functionalized zeolite MCM-41
and surface properties of)

IT 78-10-4, Tetraethyl silicate 780-69-8, Triethoxyphenylsilane
2615-18-1, 1,4-Bis(triethoxysilyl)benzene
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of phenyl-functionalized zeolite
MCM-41)

IT 7790-94-5, Chlorosulfonic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of sulfonylated phenyl-functionalized zeolite
MCM-41)

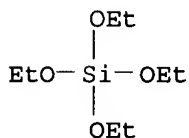
IT 107-15-3, Ethylenediamine, reactions 20439-47-8 35132-20-8,
1R,2R-1,2-Diphenylethylenediamine
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with sulfonylated phenyl-functionalized zeolite MCM-41)

IT 140-72-7, N-Cetylpyridinium bromide
RL: NUU (Other use, unclassified); USES (Uses)
(template for preparation of phenyl-functionalized zeolite MCM-41)

IT 78-10-4, Tetraethyl silicate
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of phenyl-functionalized zeolite
MCM-41)

RN 78-10-4 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 4 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:528389 HCAPLUS

DN 141:367601

TI Preparation of organo-functionalized mesoporous zeolites supported
phosphine-rhodium complexes and their catalytic performance for hexene-1
hydroformylation

AU Yang, Yong; Peng, Qingrong; Yuan, Youzhu

CS Department of Chemistry, Xiamen University, Xiamen, 361005, Peop. Rep.
China

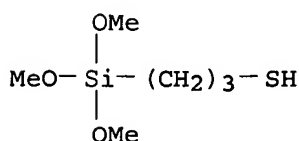
SO Cuihua Xuebao (2004), 25(5), 421-425
CODEN: THHPD3; ISSN: 0253-9837

PB Kexue Chubanshe

DT Journal

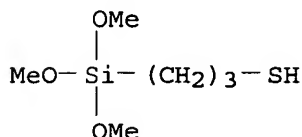
LA Chinese

- AB Organo-functionalized mesoporous zeolites MCM-41 and MCM-48, and amorphous SiO₂ were used as supports to prepare heterogenized phosphine-rhodium complex via anchoring for the hydroformylation of 1-hexene. The supports and the catalysts were characterized by means of XRD, BET, FT-IR and AAS. The MCM-41 and MCM-48 were functionalized with silanes containing (mono-, di-, tri-) amino-, mercapto- and nitrile-groups, resp., without destruction of the mesoporous structure of the zeolites. The catalytic performance of the catalysts was related to the structure of organo-groups and also to the structural features of the supports. Higher catalytic activity and selectivity for n-C₆H₁₃CHO were obtained in the case of the catalysts using the mesoporous zeolites functionalized with amino- and nitrile-silanes as supports. No significant decrease in the catalytic performance of the phosphine-rhodium complex immobilized on the amino-functionalized mesoporous zeolites used repeatedly for 6 times was observed
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
- ST silane mesoporous zeolite phosphine rhodium catalyst hexene hydroformylation; heptanal prepn catalyst phosphine rhodium zeolite
- IT MCM zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (MCM-48; preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- IT Hydroformylation catalysts
 (preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- IT Zeolite MCM-41
 RL: CAT (Catalyst use); USES (Uses)
 (preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- IT 1760-24-3, N-(2-Aminoethyl)-3-aminopropyltrimethoxysilane
 4420-74-0, 3-Mercaptopropyltrimethoxysilane 7631-86-9, Silica,
 uses 13822-56-5, 3-Aminopropyltrimethoxysilane 17185-29-4
 55453-24-2, 3-Cyanopropyltrimethoxysilane
 RL: CAT (Catalyst use); USES (Uses)
 (preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- IT 111-71-7, Heptanal 592-41-6, 1-Hexene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- IT 4420-74-0, 3-Mercaptopropyltrimethoxysilane
 RL: CAT (Catalyst use); USES (Uses)
 (preparation of organosilane-functionalized mesoporous zeolite-supported phosphine-rhodium complexes and their catalytic performance for hexene hydroformylation)
- RN 4420-74-0 HCAPLUS
- CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



L64 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:420973 HCAPLUS
 DN 141:245191
 TI Aminated MCM-41-tethered Wilkinson's complex: active immobilized catalyst precursor for cyclohexene hydroformylation
 AU Huang, Lin; Wu, Jian Chun; Kawi, Sibudjing
 CS Department of Chemical and Environmental Engineering, Chemical and Process Engineering Center, National University of Singapore, 119260, Singapore
 SO Reaction Kinetics and Catalysis Letters (2004), 82(1), 65-71
 CODEN: RKCLAU; ISSN: 0133-1736
 PB Akademiai Kiado
 DT Journal
 LA English
 OS CASREACT 141:245191
 AB A catalyst systems of a Wilkinson complex, $\text{RhCl}(\text{PPh}_3)_3$, supported on MCM-41 zeolite via an aminoalkylsilane ligand is fairly effective and stable for cyclohexene hydroformylation at 100° and 28 bar of equimolar CO and H₂. This catalyst has the advantages of both high activity and resistance to rhodium leaching.
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 24, 67
 ST rhodium triphenylphosphine chloride complex anchoring MCM41 amine ligand; hydroformylation cyclohexene Wilkinson complex MCM41 catalyst
 IT Catalyst supports
 Hydroformylation catalysts
 (activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT Zeolite MCM-41
 RL: CAT (Catalyst use); USES (Uses)
 (amino- and thio-functionalized, support; activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 100-49-2P, Cyclohexane methanol 110-82-7P, Cyclohexane, preparation
 RL: BYP (Byproduct); PREP (Preparation)
 (activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 14694-95-2, Chlorotris(triphenylphosphine)rhodium
 RL: CAT (Catalyst use); USES (Uses)
 (activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 2043-61-0P, Cyclohexane carboxaldehyde
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 110-83-8, Cyclohexene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 919-30-2, Aminopropyltriethoxysilane 4420-74-0, 3-(Trimethoxysilyl)propanethiol
 RL: CAT (Catalyst use); USES (Uses)
 (zeolite functionalization ligand; activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in cyclohexene hydroformylation)
 IT 4420-74-0, 3-(Trimethoxysilyl)propanethiol
 RL: CAT (Catalyst use); USES (Uses)
 (zeolite functionalization ligand; activity and stability of catalyst system of $\text{RhCl}(\text{PPh}_3)_3$ amino-anchored to MCM-41 in

cyclohexene hydroformylation)
 RN 4420-74-0 HCAPLUS
 CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

- L64 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:271022 HCAPLUS
 DN 141:56013
 TI Selective synthesis of Bisphenol-A over mesoporous MCM silica catalysts
 functionalized with sulfonic acid groups
 AU Das, Debasish; Lee, Jyh-Fu; Cheng, Soofin
 CS Department of Chemistry, National Taiwan University, Taipei, 106, Taiwan
 SO Journal of Catalysis (2004), 223(1), 152-160
 CODEN: JCTLA5; ISSN: 0021-9517
 PB Elsevier Science
 DT Journal
 LA English
 OS CASREACT 141:56013
 AB Mesoporous MCM-41 and MCM-48 silicas anchored with sulfonic acid (SO₃H)
 groups via postsynthesis modification are very effective for the synthesis
 of bisphenol A by liquid-phase condensation of phenol with acetone. Higher
 amts. of thiol groups can be incorporated in MCM-48 silicas presumably due
 to the presence of larger number of surface silanol groups. However sulfur
 K-edge XANES spectroscopy reveals that effective oxidation of the precursor
 thiol (SH) groups to the sulfonic acid (SO₃H) groups was necessary for
 obtaining samples of good catalytic activity. It was noted that when
 sulfur loadings exceed 1.5 meq/g solid a part of the sulfur atoms remains
 in the reduced form even after prolonged oxidation MCM-41 silica anchored
 with sulfonic acid groups has comparable catalytic activity to that of
 com. ion-exchange resin Amberlite-120 and the former also showed higher
 selectivity toward the desired p,p' isomer. MCM-48 silica-anchored
 samples are equally effective for selective synthesis of bisphenol A.
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 ST sulfonic acid functionalized MCM zeolite synthesis bisphenol A
 IT MCM zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (MCM-48, sulfonic acid-functionalized; in selective synthesis of
 bisphenol A over mesoporous MCM silica catalysts functionalized with
 sulfonic acid groups)
 IT Zeolite MCM-41
 RL: CAT (Catalyst use); USES (Uses)
 (sulfonic acid-functionalized; in selective synthesis of bisphenol A
 over mesoporous MCM silica catalysts functionalized with sulfonic acid
 groups)
 IT 4420-74-0D, 3-Mercaptopropyltrimethoxysilane, reaction products
 with MCM zeolites, oxidized
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst; selective synthesis of bisphenol A over mesoporous MCM
 silica catalysts functionalized with sulfonic acid groups)
 IT 67-64-1, Acetone, reactions 108-95-2, Phenol, reactions

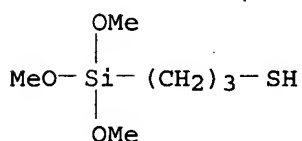
RL: RCT (Reactant); RACT (Reactant or reagent)
 (in selective synthesis of bisphenol A over mesoporous MCM silica catalysts functionalized with sulfonic acid groups)

IT 80-05-7P, Bisphenol A, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (selective synthesis of bisphenol A over mesoporous MCM silica catalysts functionalized with sulfonic acid groups)

IT 4420-74-0D, 3-Mercaptopropyltrimethoxysilane, reaction products with MCM zeolites, oxidized
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst; selective synthesis of bisphenol A over mesoporous MCM silica catalysts functionalized with sulfonic acid groups)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:234123 HCAPLUS
 DN 140:393324
 TI Nafion/acid functionalized zeolite nanocomposite fuel cell membranes
 AU Holmberg, Brett A.; Wang, Huanting; Norbeck, Joseph M.; Yan, Yushan
 CS College of Engineering - Center for Environmental Research and Technology
 (CE-CERT) and Department of Chemical and Environmental Engineering,
 University of California, Riverside, CA, 92521, USA
 SO Polymer Preprints (American Chemical Society, Division of Polymer
 Chemistry) (2004), 45(1), 24-25
 CODEN: ACPPAY; ISSN: 0032-3934
 PB American Chemical Society, Division of Polymer Chemistry
 DT Journal; (computer optical disk)
 LA English
 AB Organic/inorg. composite membranes capable for fuel cell operation at temps.
 in the 140 X range can be made with a polymer such as Nafion (for
 proton conductivity and gas impermeability) and an inorg. additive such as
 silica
 to maintain hydration and reduce swelling. This study uses an
 acid-functionalized microporous Zeolite with high surface area and inner
 pore surface area to make more efficient use of the sulfonation
 precursors. A phenylethyl functionalized beta zeolite was synthesized by
 substituting some phenylethyl trimethoxysilane in the silica precursors,
 and the organic template removed and the phenylethyl groups were
 simultaneously sulfonated with sulfuric acid. Composite membranes with
 Nafion were cast, boiled in hydrogen peroxide, and doped with sulfuric
 acid. XRD, SEM, impedance spectroscopy and methanol permeability of the
 membranes were measured. Loadings of 20 weight% zeolite were too much and the
 film exhibited a cracked crust of zeolite. Overall, the 5 weight% Nafion/
 acid functionalized zeolite beta nanocomposite membrane possessed a proton
 conductivity/ methanol permeability (selectivity) ratio 70 % high than com.
 Nafion 117 at 21 °C, and 110 % higher than com. Nafion 117 at 77
 °C. The 10 wt% sulfonated zeolite BEA nanocomposite membrane
 performed poorly relative to the 5 wt% sulfonated zeolite BEA, Nafion 117,

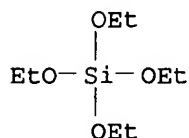
- and recast Nafion membranes, and its lack of improvement is likely caused by the inhomogeneous dispersion of the nanocrystals within the membrane.
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 36, 57
- ST Nafion acid functionalized beta zeolite nanocomposite fuel cell membrane
- IT Fuel cell separators
Nanocomposites
Sulfonation
(Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(fluorine- and sulfo-containing, ionomers, nanocomposite with zeolites; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Beta zeolites
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(nanocomposites with Nafion; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Fluoropolymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, nanocomposite with zeolites; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Ionomers
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, nanocomposite with zeolites; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Ionic conductivity
(proton; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT Permeability
(to methanol; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT 67-56-1, Methanol, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT 66796-30-3, Nafion 117
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)
- IT 78-10-4, Tetraethoxysilane 7429-90-5, Aluminum, reactions
7664-93-9, Sulfuric acid, reactions 49539-88-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)

IT 7631-86-9, Fumed silica, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (colloidal; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)

IT 1344-28-1P, Alumina, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (phase in zeolite; Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)

IT 78-10-4, Tetraethoxysilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (Nafion/acid functionalized beta zeolite nanocomposite fuel cell membranes)

RN 78-10-4 HCAPLUS
 CN Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:30989 HCAPLUS
 DN 141:227187
 TI Synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite functionalized with sulfonic acid group
 AU Sun, Mingzhu; Qi, Yutai; Zhang, Li; Yuan, Xingdong; Shen, Jian
 CS Department of Petrochemical Engineering, Liaoning University of Petroleum & Chemical technology, Fushun, 113001, Peop. Rep. China
 SO Jingxi Shiyou Huagong (2003), (1), 4-7
 CODEN: JSHIBF; ISSN: 1003-9384
 PB Jingxi Shiyou Huagong Bianjibu
 DT Journal
 LA Chinese
 OS CASREACT 141:227187
 AB D-SBA-15-SO3H as a mesoporous material with sulfonic acid group was prepared by a direct synthesis method. Several kinds of solid and liquid acidic catalysts for esterification of acetic acid with n-amyl alc. were investigated, of which the d-SBA-15-SO3H is the best solid catalyst for synthesis of n-amyl acetate. The factors affecting the catalytic activity of d-SBA-15-SO3H were studied, and the optimum reaction conditions were found as follows: amyl alc./acetic acid = 1.1:1 (mol), reaction temperature 120°, reaction time 4 h, ratio of catalyst to acetic acid 2 g/mol. After repeated use, d-SBA-15-SO3H is stable. The catalyst d-SBA-15-SO3H is useful as a replacement for H2SO4.

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 ST amyl acetate mesoporous zeolite sulfonic acid catalyst; acetic acid amyl alc esterification catalyst
 IT Zeolites (synthetic), preparation
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (sulfonated; synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite functionalized with sulfonic acid group)

IT Esterification catalysts
 (synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite
 functionalized with sulfonic acid group)

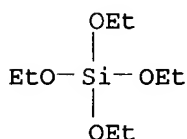
IT 628-63-7P, n-Amyl acetate
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite
 functionalized with sulfonic acid group)

IT 64-19-7, Acetic acid, reactions 71-41-0, Amyl alcohol, reactions
 78-10-4, TEOS 4420-74-0, γ -
 Mercaptopropyltrimethoxysilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite
 functionalized with sulfonic acid group)

IT 78-10-4, TEOS 4420-74-0, γ -
 Mercaptopropyltrimethoxysilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (synthesis of n-amyl acetate over d-SBA-15 mesoporous zeolite
 functionalized with sulfonic acid group)

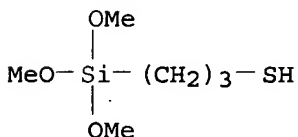
RN 78-10-4 HCAPLUS

CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



L64 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:15352 HCAPLUS

DN 140:166165

TI Preparation of hollow zeolite spheres and three-dimensionally ordered
 macroporous zeolite monoliths with functionalized interiors

AU Dong, Angang; Ren, Nan; Yang, Wuli; Wang, Yajun; Zhang, Yahong; Wang,
 Deju; Hu, Jianhua; Gao, Zi; Tang, Yi

CS Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials,
 Department of Chemistry, Fudan University, Shanghai, 200433, Peop. Rep.
 China

SO Advanced Functional Materials (2003), 13(12), 943-948
 CODEN: AFMDC6; ISSN: 1616-301X

PB Wiley-VCH Verlag GmbH & Co. KGaA

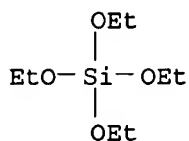
DT Journal

LA English

AB A flexible strategy involving hydrothermal transformation of
 guest-incorporated zeolite-seeded mesoporous silica spheres was proposed
 to prepare guest-encapsulated hollow zeolite spheres and three dimensionally
 (3D) ordered macroporous zeolite monoliths. The guest species that were

pre-incorporated into the mesopores of silica spheres can be spontaneously encapsulated inside the formed hollow zeolite shells by consuming silica nutrition of the original mesoporous silica cores during the hydrothermal process. A wide range of guest materials with a size ranging from nanometers to micrometers, e.g., Ag and PdO nanoparticles, and mesoporous spheres of carbon and polydivinylbenzene polymer of micrometer size were successfully encapsulated into both discrete hollow zeolite spheres and 3D ordered macroporous zeolite monoliths. Such materials are expected to find a variety of applications such as catalysis, adsorption, and microreactors for their special structures with active species inside and zeolitic porous shell outside.

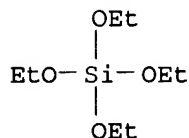
CC 49-4 (Industrial Inorganic Chemicals)
 ST hollow zeolite sphere mesoporous functionalized zeolite monolith prepn
 IT Spheres
 (hollow; preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT Nanoparticles
 (in preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT Porous materials
 (mesoporous; preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT Encapsulation
 (microencapsulation; preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT Zeolites (synthetic), preparation
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
 (preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT 78-10-4, Tetraethoxysilane 4499-86-9, Tetrapropylammonium hydroxide 7631-86-9, Silica, processes
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (in preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 IT 1314-08-5P, Palladium monoxide 7440-22-4P, Silver, preparation 7440-44-0P, Carbon, preparation 9003-69-4P, Polydivinylbenzene
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
 (preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors containing particles of)
 IT 78-10-4, Tetraethoxysilane
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (in preparation of hollow zeolite spheres and three dimensionally ordered macroporous zeolite monoliths with functionalized interiors)
 RN 78-10-4 HCAPLUS
 CN Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:79168 HCAPLUS
DN 139:300758
TI Structural analysis of oxyanion-cation complexes anchored by organic group
in mesoporous silicas
AU Yoshitake, Hideaki; Yokoi, Toshiyuki; Tatsumi, Takashi
CS Graduate School of Environment and Information Sciences, Yokohama National
University, Yokohama, 240-8501, Japan
SO Studies in Surface Science and Catalysis (2002), 144 (Characterization of
Porous Solids VI), 677-684
CODEN: SSCTDM; ISSN: 0167-2991
PB Elsevier Science B.V.
DT Journal
LA English
AB The structure of oxyanion-Fe³⁺-amino group complexes in the pore of MCM-41
have been studied to develop heterogeneous chemical of oxyanion-cation
interactions on the oxide surface with organic groups. XAFS spectroscopies
were applied to the structural analyses. Two kinds of structure were
shown in arsenate- and molybdate-Fe complexes. One is edge-sharing and
the other is corner-sharing coordinations. In contrast, a uniform
coordination structure was implied in chromate and selenate adsorptions.
The stoichiometry at the adsorption saturation and the coordination nos.
suggest that a part of chromate, selenate and molybdate are reduced into
monovalent anions.
CC 78-9 (Inorganic Chemicals and Reactions)
ST zeolite iron amine functionalized adsorption oxyanion; arsenate adsorption
aminoiron functionalized MCM zeolite; molybdate adsorption aminoiron
functionalized MCM zeolite; chromate adsorption aminoiron functionalized
MCM zeolite; selenate adsorption aminoiron functionalized MCM zeolite;
redn oxyanion adsorption aminoiron functionalized zeolite
IT Oxyanions
(adsorption of oxyanions by iron-amine-functionalized MCM-41 zeolite)
IT Zeolite MCM-41
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(iron-amine-functionalized; adsorption of oxyanions by functionalized
zeolite and resulting coordination structure)
IT 7784-41-0, Potassium arsenate (KH₂AsO₄) 7789-00-6 7790-59-2, Potassium
selenate (K₂SeO₄) 13446-49-6, Potassium molybdate (K₂MoO₄)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PYP (Physical process); PROC (Process)
(adsorption of oxyanions by iron-amine-functionalized MCM-41 zeolite)
IT 112-00-5, Dodecyltrimethylammonium chloride
RL: NUU (Other use, unclassified); USES (Uses)
(for preparation of iron-amine-functionalized MCM-41 zeolite)
IT 78-10-4, TEOS 1760-24-3 7705-08-0, Ferric chloride, reactions
15875-97-5, Trimethylammonium hydroxide
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of iron-amine-functionalized MCM-41
zeolite)

IT 78-10-4, TEOS
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (for preparation of iron-amine-functionalized MCM-41 zeolite)
 RN 78-10-4 HCAPLUS
 CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:866582 HCAPLUS
 DN 138:126662
 TI Preparation of thiol-functionalized mesoporous molecular sieve and removal of Pb²⁺, Hg²⁺, and Cd²⁺ in water
 AU Xu, Ying-Ming; Li, Jun-Xin; Dai, Xiao-Hua; Zhang, Ze; Gao, Huai-You
 CS Key Laboratory of Agro-Product Pollution Control of MOA, Agro-Environmental Protection Institute of MOA, Tianjin, 300191, Peop. Rep. China
 SO Yingyong Huaxue (2002), 19(10), 941-945
 CODEN: YIHUED; ISSN: 1000-0518
 PB Yingyong Huaxue Bianji Weiyuanhui
 DT Journal
 LA Chinese
 AB Organic ligands containing the thiol(--SH) metal-chelating functional group were grafted to the surface of a mesoporous mol. sieve MCM-41 prepared from tetraethylorthosilicate, tetramethylanmonium hydroxide and hexadecyl tri-Me ammonium bromide. X-ray diffraction, IR spectroscopy, elemental anal., thermogravimetric anal., ²⁹Si and ¹³C solid-state NMR spectroscopy results demonstrated the presence of the organic ligands in the modified thiol-functionalized material (designated as MP-MCM-41). MP-MCM-41 was found to be highly effective for the adsorption of Hg(II), Pb(II), and Cd(II) ions, exhibiting high metal ion uptake capacities of 148.20, 135.76, and 36.50 mg/g-1, resp. The adsorption was fitted to Langmuir isotherms.
 CC 61-5 (Water)
 Section cross-reference(s): 57
 ST thiol functionalized mesoporous zeolite lead mercury cadmium adsorption water
 IT Water purification
 (adsorption; preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)
 IT Sulfhydryl group
 (preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)
 IT Zeolite MCM-41
 RL: NUU (Other use, unclassified); RGT (Reagent); RACT (Reactant or reagent); USES (Uses)
 (preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)
 IT 7439-92-1, Lead, processes 7439-97-6, Mercury, processes 7440-43-9,

Cadmium, processes

RL: REM (Removal or disposal); PROC (Process)

(preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)

IT 4420-74-0, 3-Mercapto Propyl trimethoxy silane

RL: RGT (Reagent); RACT (Reactant or reagent)

(preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)

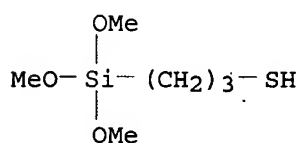
IT 4420-74-0, 3-Mercapto Propyl trimethoxy silane

RL: RGT (Reagent); RACT (Reactant or reagent)

(preparation of thiol-functionalized mesoporous zeolite for removal of Pb, Hg, and Cd from water)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



L64 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:37191 HCAPLUS

DN 136:174877

TI Preparation and characterization of nanostructured material MCM-41 and the luminescent functional supramolecule with Eu(Phen)₄ as guest

AU Yin, Wei; Zhang, Mai-sheng; Kang, Bei-sheng

CS School of Chemistry and Chemical Engineering, Zhongshan University, Canton, 510275, Peop. Rep. China

SO Faguang Xuebao (2001), 22(3), 232-236

CODEN: FAXUEW; ISSN: 1000-7032

PB Kexue Chubanshe

DT Journal

LA Chinese

AB Nanosized mesoporous mol. sieve MCM-41 was synthesized with tetra-Et orthosilicate (TEOS) as the source of SiO₂ and cetyltrimethylammonium bromide (CTABR) as the template under supersonic wave conditions. By means of high-resolution TEM (HRTEM), the nanosized MCM-41 was observed which contains ϕ 10-40 nm spherical balls possessed ϕ 2.7 nm regular uniform channels. The nanostructured material (NSM) MCM-41 has good dispersibility and its particle diameter is well distributed. The luminescent functional supramol. MCM-41-Eu(Phen)₄ between the nanosized MCM-41 and Eu(Phen)₄ was prepared in EtOH, and characterized by TEM, XRD, TG, IR and fluorescence. The NSM of MCM-41-Eu(Phen)₄ are ϕ 10-40 nm spherical balls too. The XRD patterns are similar to the normal crystal of MCM-41. The IR spectra showed that the guest Eu(Phen)₄ is non-IR-active and the -OH absorptions of the host MCM-41 are specially fine, strong and sharp in the supramol. system MCM-41-Eu(Phen)₄. The luminescence indicated that an energy barrier (0.395 eV) exists in MCM-41-Eu(Phen)₄ preventing IR radiation (<3030 cm⁻¹) from reaching the guest Eu(Phen)₄ due to shielding effect of the host on the guest. The mols. of Eu(Phen)₄ presenting in the channel of MCM-41 had formed the centers of luminescence, hence the functional supramol. NSM with strong luminescence under UV excitation was obtained. The transitions 5D₀→7F_J (J = 1, 2, 3, 4, 5) of Eu³⁺ with peak values 590.4, 614.6 (617.9), 653.4, 685.4, and 699.6 nm were observed in which the elec. dipole transition, especially, 5D₀→7F₂ (617.9 nm red), is as strong as that for

the fine powder of Eu(Phen)₄. This work resulted in a new field of luminescence and a new route to prepare complex luminescent NSM.

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST luminescence zeolite MCM41 functional supramol europium phenanthroline guest

IT Fluorescence
IR spectra
Luminescence
Thermal decomposition
Transmission electron microscopy
X-ray diffraction
(of zeolite MCM-41 functional supramol. with europium phenanthroline complex as guest)

IT Zeolite MCM-41
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and characterization of nanostructured material and luminescent functional supramol. with europium phenanthroline complex as guest)

IT 78-10-4, Tetraethylsilicate
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation and characterization of zeolite MCM-41 and luminescent functional supramol. with europium phenanthroline complex as guest from)

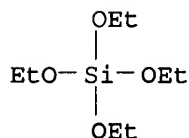
IT 57-09-0, Cetyltrimethylammonium bromide
RL: NUU (Other use, unclassified); USES (Uses)
(preparation and characterization of zeolite MCM-41 and luminescent functional supramol. with europium phenanthroline complex as guest using template of)

IT 397843-02-6P
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(preparation and characterization of zeolite MCM-41 and luminescent functional supramol. with guest of)

IT 78-10-4, Tetraethylsilicate
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation and characterization of zeolite MCM-41 and luminescent functional supramol. with europium phenanthroline complex as guest from)

RN 78-10-4 HCAPLUS

CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



IT 57-09-0, Cetyltrimethylammonium bromide
RL: NUU (Other use, unclassified); USES (Uses)
(preparation and characterization of zeolite MCM-41 and luminescent functional supramol. with europium phenanthroline complex as guest using template of)

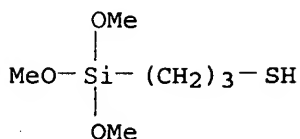
RN 57-09-0 HCAPLUS

CN 1-Hexadecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)

Me₃⁺N⁻ (CH₂)₁₅-Me

● Br⁻

L64 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:774302 HCAPLUS
 DN 136:136585
 TI Sulfonic acid functionalized mesoporous MCM-41 silica as a convenient catalyst for Bisphenol-A synthesis
 AU Das, Debasish; Lee, Jyh-Fu; Cheng, Soofin
 CS Department of Chemistry, National Taiwan University, Taipei, 106, Taiwan
 SO Chemical Communications (Cambridge, United Kingdom) (2001), (21), 2178-2179
 CODEN: CHCOFS; ISSN: 1359-7345
 PB Royal Society of Chemistry
 DT Journal
 LA English
 AB Sulfonic acid groups anchored to the surface of mesoporous MCM-41 silica were identified with S K-edge XANES spectra and the material is an efficient catalyst for the liquid phase condensation of phenol with acetone to form bisphenol-A with high selectivity.
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67
 ST sulfonic acid functionalized zeolite bisphenol catalyst
 IT Condensation reaction catalysts
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 IT Zeolite MCM-41
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 IT 4420-74-0D, 3-Mercaptopropyltrimethoxysilane, reaction products with zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 IT 80-05-7P, Bisphenol A, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 IT 67-64-1, Acetone, reactions 108-95-2, Phenol, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 IT 4420-74-0D, 3-Mercaptopropyltrimethoxysilane, reaction products with zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (sulfonic acid functionalized mesoporous MCM-41 silica as convenient catalyst for Bisphenol A synthesis)
 RN 4420-74-0 HCAPLUS
 CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX



RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:773294 HCAPLUS
DN 136:256173
TI Comparison of 3-aminopropylsilane linked to MCM-41- and HMS-type silicas synthesized under biphasic and monophasic conditions
AU Macquarrie, D. J.; Rocchia, M.; Onida, B.; Garrone, E.; Lentz, P.; Nagy, J. B.; Brunel, D.; Blanc, A. C.; Fajula, F.
CS Department of Chemistry, University of York, Heslington-York, YO10 5DD, UK
SO Studies in Surface Science and Catalysis (2001), 135(Zeolites and Mesoporous Materials at the Dawn of the 21st Century), 4849-4856
CODEN: SSCTDM; ISSN: 0167-2991
PB Elsevier Science B.V.
DT Journal; (computer optical disk)
LA English
AB Functionalized mesoporous silicas prepared by either grafting (by silylation of MCM-41) or by self-assembly co-condensation of organically functionalized SiO₂ precursors and SiO₂ precursor (RO)₄Si in presence of nonionic surfactants feature different properties. Materials were characterized by N₂ sorption isotherms, FTIR and MAS NMR. Imine formation during contacting the different samples with probes such as acetone and benzaldehyde demonstrated different environments of the anchored amine groups.
CC 78-4 (Inorganic Chemicals and Reactions)
ST zeolite MCM 41 aminopropylsilane functionalized prepn; silicate HMS aminopropylsilane functionalized prepn; aldehyde reaction aminopropylsilane functionalized silicate MCM HMS; imine formation aminopropylsilane functionalized silicate structure; grafting cocondensation functionalized zeolite prepn reactivity comparison
IT Zeolite MCM-41
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(aminopropylsilane-functionalized; preparation and reaction with aldehydes to form imine)
IT Silicates, preparation
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(aminopropylsilane-functionalized; preparation and reaction with aldehydes to form imine in mesoporous)
IT IR spectra
NMR (nuclear magnetic resonance)
(of aminopropylsilane-functionalized zeolite MCM-41 and mesoporous silicate HMS)
IT Pore
Surface area
(volume and structure of aminopropylsilane-functionalized zeolite MCM-41 and mesoporous silicate HMS)
IT 7631-86-9, Aerosil 200V, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(colloidal; for preparation of zeolite MCM-41 with aminopropylsilane-functionalization)

IT 6382-82-7, 3-Aminopropylsilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (for preparation of functionalized zeolite MCM-41 and mesoporous silicate HMS)

IT 78-10-4, TEOS
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (for preparation of silicate HMS with aminopropylsilane-functionalization)

IT 57-09-0, Cetyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (for preparation of zeolite MCM-41 with aminopropylsilane-functionalization)

IT 57-09-0, Cetyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (for preparation of zeolite MCM-41 with aminopropylsilane-functionalization)

RN 57-09-0 HCAPLUS
 CN 1-Hexadecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)

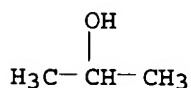
$\text{Me}_3\text{N}^-(\text{CH}_2)_{15}-\text{Me}$

● Br⁻

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:772615 HCAPLUS
 DN 136:233832
 TI Asymmetric trimethylsilylcyanation of benzaldehyde catalyzed by chiral Ti(IV) salen complexes immobilized on MCM-41
 AU Kim, Joo-Ho; Kim, Geon-Joong
 CS Department of Chemical Engineering, College of Engineering, Inha University, Inchon, 402-751, S. Korea
 SO Studies in Surface Science and Catalysis (2001), 135(Zeolites and Mesoporous Materials at the Dawn of the 21st Century), 3646-3653
 CODEN: SSCTDM; ISSN: 0167-2991
 PB Elsevier Science B.V.
 DT Journal; (computer optical disk)
 LA English
 AB The efficiency of unsym. chiral salen ligands in Ti(IV) complex catalysts was examined in the asym. trimethylsilylcyanation of benzaldehyde. High enantioselectivity was attainable over chiral Ti(IV)(salen) complexes prepared from salicylaldehyde and 3,5-Di-tert-butylsalicylaldehyde derivative as compared to the conventional salen catalyst. Enantiomeric excess of the corresponding reaction product was generally more than 70% over unsym. chiral salen catalysts. The chiral Titanium(IV) salen complexes immobilized on mesoporous MCM-41 zeolite by multi-grafting method showed a relatively high enantioselectivity for the addition of trimethylsilyl cyanide to benzaldehyde.
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 29, 67
 ST titanium salen catalyst zeolite support cyanation trimethylsilylcyanide benzaldehyde; asym synthesis trimethylsilylcyanide benzaldehyde titanium salen catalyst

- IT Catalyst supports
Enantiomers
(asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT Cyanation catalysts
(enantioselective; asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT Zeolite MCM-41
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(support; asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT Schiff bases
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(titanium complexes, chiral; asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT 203944-13-2DP, reaction products with mercaptopropylsilyl-functionalized zeolite 203944-13-2P 259087-67-7DP, reaction products with mercaptopropylsilyl-functionalized zeolite 259087-67-7P 403616-93-3DP, reaction products with mercaptopropylsilyl-functionalized zeolite 403616-93-3P 403617-61-8DP, reaction products with mercaptopropylsilyl-functionalized zeolite 403617-61-8P
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT 66985-47-5P 66985-48-6P 120443-82-5P
RL: IMF (Industrial manufacture); PREP (Preparation)
(asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT 89-98-5, 2-Chlorobenzaldehyde 90-02-8, Salicylaldehyde, reactions 100-52-7, Benzaldehyde, reactions 123-11-5, p-Methoxybenzaldehyde, reactions 546-68-9, Titanium tetraisopropoxide 999-97-3, Hexamethyldisilazane 4756-00-7, 3-Mercaptopropylsilane 7550-45-0, Titanium tetrachloride, reactions 7677-24-9, Trimethylsilyl cyanide 20439-47-8, (1R,2R)-(-)-1,2-Diaminocyclohexane 29841-69-8, (1S,2S)-(-)-1,2-Diphenylethylenediamine 37942-07-7, 3,5-Di-tert-butylsalicyl aldehyde
RL: RCT (Reactant); RACT (Reactant or reagent)
(asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- IT 546-68-9, Titanium tetraisopropoxide
RL: RCT (Reactant); RACT (Reactant or reagent)
(asym. trimethylsilylcyanation of benzaldehyde catalyzed by prepared chiral Ti(salen) complexes immobilized on MCM-41)
- RN 546-68-9 HCAPLUS
- CN 2-Propanol, titanium(4+) salt (9CI) (CA INDEX NAME)

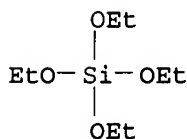


● 1/4 Ti(IV)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:319131 HCAPLUS
DN 135:84154
TI Photochemical pattern transfer and patterning of continuous zeolite films on glass by direct dipping in synthesis gel
AU Ha, Kwang; Lee, Yun-Jo; Chun, Yu Sung; Park, Yong Soo; Lee, Goo Soo; Yoon, Kyung Byung
CS Center for Microcrystal Assembly and Department of Chemistry, Sogang University, Seoul, 121-742, S. Korea
SO Advanced Materials (Weinheim, Germany) (2001), 13(8), 594-596
CODEN: ADVMEW; ISSN: 0935-9648
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB The authors demonstrated that photodegrdn. of various organic groups tethered to glass plates is a highly versatile and effective way of preparing glass plates patterned with organic functional groups and that direct dipping of the patterned glass plates into the synthesis gel readily leads to glass plates patterned with continuous zeolite films. The glass plates were prepared with tethered 3-iodopropyl (IP) groups via siloxane linkages. The glass plates with tethered IP groups were then imagewise exposed to UV light through a photomask. After exposure to UV for 1 h, the IP-tethered glass plates were allowed to come into contact with plain ZSM-5 crystals in boiling toluene for 3 h. The SEM image of the glass plates, after sonication for 2 min, revealed that the ZSM 5 crystals were attached only on the masked regions. The image of the zeolite film at higher magnification clearly revealed that the film consists of a monolayer of ZSM-5 crystals. Upon switching from plain ZSM-5 crystals to those with tethered 3-chloropropyl- (or any 3-halopropyl) groups, only the unmasked spots became covered with the monolayers of ZSM-5 crystals. The authors also explored patterning of continuous ZSM-5 films by direct dipping of the glass plates patterned with organic functional groups into the zeolite synthesis gel (tetraethylsilicate/tetrapropylammonium hydroxide/sodium aluminate). The authors found that vividly patterned square ZSM-5 films, after the shape of the grid, were readily achieved by direct dipping of glass plates patterned with Pr (PR) groups into the synthesis gel. It was found that n-octadecyl (OD) and 3-aminopropyl (AP) groups were also highly effective for the direct dipping method, which also worked well for zeolite-A and silicalite-1.
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST photoimaging zeolite film photodegrdn surface org functional group
IT Functional groups
Photoimaging
Photolysis
(preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
IT A zeolites
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
IT Zeolite ZSM-5
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)

- (preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- IT Silicalites (zeolites)
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (silicalite 1; preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- IT 13822-56-5, 3-Aminopropyltrimethoxysilane
 RL: NUU (Other use, unclassified); USES (Uses)
 (preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- IT 2530-87-2, 3-Chloropropyltrimethoxysilane 14867-28-8,
 3-Iodopropyltrimethoxysilane 51826-90-5, 3-Bromopropyltrimethoxysilane
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- IT 78-10-4, Tetraethylsilicate 1067-25-0 1302-42-7, Sodium aluminate 1313-59-3, Sodium oxide (Na₂O), reactions 1344-28-1, Alumina, reactions 3069-42-9, n-Octadecyltrimethoxysilane 4499-86-9, Tetrapropylammonium hydroxide
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- IT 78-10-4, Tetraethylsilicate
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (preparation of glass plates patterned with continuous zeolite films by imagewise photodegrdn. of organic functional groups tethered to glass plates followed by dipping in zeolite synthesis gel)
- RN 78-10-4 HCAPLUS
 CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2000:742559 HCAPLUS
 DN 134:62150
 TI Pore Surface Functionalization of MCM-48 Mesoporous Silica with Tungsten and Molybdenum Metal Centers: Perspectives on Catalytic Peroxide Activation
 AU Morey, M. S.; Bryan, J. D.; Schwarz, S.; Stucky, G. D.
 CS Chemistry Department, University of California, Santa Barbara, CA, 93106, USA
 SO Chemistry of Materials (2000), 12(11), 3435-3444

CODEN: CMATEX; ISSN: 0897-4756

PB American Chemical Society

DT Journal

LA English

AB The pore surface of MCM-48 mesoporous silica was functionalized with tungsten and molybdenum metal centers by the anhydrous reaction of metal alkoxides with surface silanol groups. Resulting metal-oxo species were attached via covalent M-O-Si bonds as confirmed with photoacoustic (PAS)-FTIR. Diffuse reflectance UV-visible spectroscopy indicates that the metal oxo groups are predominantly comprised of tetrahedral and octahedral coordinated monomers. MCM-48 grafted with Mo and W is active for brominating phenol red with hydrogen peroxide at neutral pH in a manner similar to Ti-MCM-48, as we reported earlier. The rates of bromination for Mo, W, and four other metals, after normalization for metal concentration, measured as absorption peak intensities of the resultant bromophenol blue, are as follows: 50p46:16:2.8p1:0 W:Mo:Ti:Zr:V:Re. The different rates of reactivity, and hence the general degree of metal-peroxo activation, can be explained on the basis of size, charge, coordination sphere, and electronegativity of the central metal.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 22, 66

ST tungsten pore surface **functionalization** MCM 48 zeolite
; molybdenum pore surface **functionalization** MCM 48
zeolite; catalytic peroxide activation tungsten molybdenum MCM 48
zeolite; phenol red bromination tungsten molybdenum MCM 48 zeolite

IT Bromination catalysts
Bromination kinetics
(for phenol red; pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT Pore .
Surface reaction
(pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT Transition metals, uses
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT MCM **zeolites**
RL: CAT (Catalyst use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(pore surface **functionalization** of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT Metal alkoxides
Peroxides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT 143-74-8, Phenol red
RL: RCT (Reactant); RACT (Reactant or reagent)
(bromination of; pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT 7439-98-7, Molybdenum, uses 7440-15-5, Rhenium, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

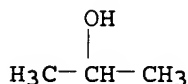
IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT 546-68-9, Titanium tetraisopropoxide 5588-84-1, Triisopropoxyvanadium oxide 7722-84-1, Hydrogen peroxide, reactions 23519-77-9, Zirconium tetrapropoxide 26143-11-3, Tungsten pentaethoxide 74060-96-1
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

IT 546-68-9, Titanium tetraisopropoxide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (pore surface functionalization of MCM-48 mesoporous silica with tungsten and molybdenum metal centers and perspectives on catalytic peroxide activation)

RN 546-68-9 HCAPLUS

CN 2-Propanol, titanium(4+) salt (9CI) (CA INDEX NAME)



● 1/4 Ti(IV)

RE.CNT 62 THERE ARE 62 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:361323 HCAPLUS

DN 133:152240

TI Use of Delaminated Zeolites (ITQ-2) and Mesoporous Molecular Sieves in the Production of Fine Chemicals: Preparation of Dimethylacetals and Tetrahydropyranylation of Alcohols and Phenols

AU Rodriguez, I.; Climent, M. J.; Iborra, S.; Fornes, V.; Corma, A.

CS Instituto de Tecnologia Quimica (UPV-CSIC), Universidad Politecnica de Valencia, Valencia, 46022, Spain

SO Journal of Catalysis (2000), 192(2), 441-447
 CODEN: JCTLA5; ISSN: 0021-9517

PB Academic Press

DT Journal

LA English

AB Protection of aldehydes by formation of the corresponding di-Me acetals and protection of alcs. and phenols by formation of the corresponding tetrahydropyranyl ethers have been carried out successfully using ITQ-2 zeolite as acid catalyst. Its catalytic activity for these reactions is compared with those obtained with MCM-22, Beta zeolites, and the mesoporous aluminosilicate MCM-41, all of them with similar Si/Al ratios. The results obtained indicate that when the reactions involve bulky

- reactants, ITQ-2 shows, in all cases, the highest activity as a consequence of the combination of its delaminated structure and the presence of strong acid sites. (c) 2000 Academic Press.
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
- ST zeolite delaminated acetalization tetrahydropyranylation catalyst prepn;
aldehyde alc phenol protection fine chem; tetrahydropyranylation
acetalization catalyst mesoporous mol sieve
- IT Alcohols, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(benzyl alc., cyclohexanol, menthol, cholesterol; preparation and use of
delaminated zeolites (ITQ-2) and mesoporous mol. sieves as
acetalization and/or tetrahydropyranylation catalyst to protect
functional groups in production of fine chems.)
- IT Aldehydes, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(heptanal, 2-phenylpropanal, diphenylacetaldehyde; preparation and use of
delaminated zeolites (ITQ-2) and mesoporous mol. sieves as
acetalization and/or tetrahydropyranylation catalyst to protect
functional groups in production of fine chems.)
- IT Crystal structure
Surface area
(in preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol.
sieves as acetalization and/or tetrahydropyranylation catalyst to
protect functional groups in production of fine chems.)
- IT Phenols, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(phenol, naphthol; preparation and use of delaminated zeolites (ITQ-2) and
mesoporous mol. sieves as acetalization and/or tetrahydropyranylation
catalyst to protect functional groups in production of fine chems.)
- IT Acetalization catalysts
(preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol.
sieves as acetalization and/or tetrahydropyranylation catalyst to
protect functional groups in production of fine chems.)
- IT Aluminosilicates, uses
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol.
sieves as acetalization and/or tetrahydropyranylation catalyst to
protect functional groups in production of fine chems.)
- IT Beta zeolites
Zeolite MCM-22
Zeolite MCM-41
Zeolites (synthetic), preparation
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);
PREP (Preparation); USES (Uses)
(preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol.
sieves as acetalization and/or tetrahydropyranylation catalyst to
protect functional groups in production of fine chems.)
- IT 57-88-5, Cholesterol, reactions 100-51-6, Benzyl alcohol, reactions
108-93-0, Cyclohexanol, reactions 1490-04-6, Menthol
RL: RCT (Reactant); RACT (Reactant or reagent)
(alc.; preparation and use of delaminated zeolites (ITQ-2) and mesoporous
mol. sieves as acetalization and/or tetrahydropyranylation catalyst to
protect functional groups in production of fine chems.)
- IT 7631-86-9, Aerosil 200, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(colloidal; in preparation and use of delaminated zeolites (ITQ-2) and
mesoporous mol. sieves as acetalization and/or tetrahydropyranylation
catalyst to protect functional groups in production of fine chems.)
- IT 57-09-0, Hexadecyltrimethylammonium bromide 111-49-9

- 1310-73-2, Sodium hydroxide, uses 4499-86-9, Tetrapropylammonium hydroxide
 RL: NUU (Other use, unclassified); USES (Uses)
 (in preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- IT 1302-42-7, Sodium aluminate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- IT 159995-97-8, Aluminum silicon oxide
 RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- IT 110-87-2, 3,4-Dihydro-2H-pyran 149-73-5, Trimethyl orthoformate
 RL: NUU (Other use, unclassified); USES (Uses)
 (preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- IT 93-53-8, 2-Phenylpropanal 108-95-2, Phenol, reactions 111-71-7, Heptanal 135-19-3, 2-Naphthol, reactions 947-91-1, Diphenylacetaldehyde
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- IT 57-09-0, Hexadecyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (in preparation and use of delaminated zeolites (ITQ-2) and mesoporous mol. sieves as acetalization and/or tetrahydropyranylation catalyst to protect functional groups in production of fine chems.)
- RN 57-09-0 HCAPLUS
 CN 1-Hexadecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)

$\text{Me}_3\text{N}^-(\text{CH}_2)_{15}-\text{Me}$

● Br^-

RE.CNT 56 THERE ARE 56 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2000:7668 HCAPLUS
 DN 132:171525
 TI The role of surface chemistry in zeolite membrane formation
 AU Hang Chau, J. L.; Tellez, C.; Yeung, K. L.; Ho, K.
 CS Department of Chemical Engineering, The Hong Kong University of Science and Technology, Kowloon, Hong Kong
 SO Journal of Membrane Science (2000), 164(1-2), 257-275
 CODEN: JMESDO; ISSN: 0376-7388
 PB Elsevier Science B.V.

KATHLEEN FULLER EIC 1700 REMSON 4B28 571/272-2505

DT Journal
 LA English
 AB The structure and chemical of support materials play an important role in zeolite film formation and have a significant influence on the separation property of the membrane material. Surface roughness and pore size define the optimum zeolite crystal size and membrane thickness. The chemical nature of the support surface influences zeolite nucleation, crystal growth and film adhesion. Chemical modification of the support surface can significantly alter the zeolite film formation. Ultrathin layers (20 nm) of metal and metal oxides were deposited onto porous stainless steel support. This method gives highly reproducible film microstructure and has a good potential for large-scale application for zeolite membrane production. The effects of surface functional groups (-SiO₂, -OH and -COOH) were simulated using adsorbed surfactants. The influence of aging and seeding on zeolite film formation also were studied.

CC 66-3 (Surface Chemistry and Colloids)
 Section cross-reference(s): 75

ST zeolite membrane formation stainless steel support chem modification
 IT Thermal aging
 (effects of aging on zeolite membrane formation)

IT Surfactants
 (effects of surface functional groups on zeolite membrane formation studied by modifying stainless steel support with adsorbed surfactants)

IT Thickness
 (film; of zeolite membrane on metal and metal oxide-coated stainless steel)

IT Surface structure
 (of zeolite membrane on metal and metal oxide-coated stainless steel)

IT Crystallization
 Films
 Membranes, nonbiological
 (role of structure and chemical of support surface in zeolite membrane formation studied by modifying stainless steel support)

IT Silicalites (zeolites)
 Zeolites (synthetic), properties
 RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
 (role of structure and chemical of support surface in zeolite membrane formation studied by modifying stainless steel support)

IT Functional groups
 (surface; effects of surface functional groups on zeolite membrane formation studied by modifying stainless steel support with adsorbed surfactants)

IT Composition
 (surface; of neat, metal-coated, and metal oxide-coated stainless steel)

IT 107-96-0, 3-Mercaptopropionic acid 4420-74-0, 3-Mercaptopropyl trimethoxysilane 19721-22-3, 3-Mercapto-1-propanol
 RL: NUU (Other use, unclassified); USES (Uses)
 (effects of surface functional groups on zeolite membrane formation studied by modifying stainless steel support with adsorbed surfactants)

IT 106-97-8, n-Butane, properties 7440-59-7, Helium, properties 7727-37-9, Nitrogen, properties
 RL: PRP (Properties)
 (gas permeabilities across zeolite membrane on metal-coated stainless steel)

IT 12597-68-1, Stainless steel, properties
 RL: PRP (Properties)

(role of structure and chemical of support surface in zeolite membrane formation studied by modifying stainless steel support)

IT 1309-37-1, Ferric oxide, uses 1344-28-1, Alumina, uses 7439-89-6, Iron, uses 7440-22-4, Silver, uses 7440-47-3, Chromium, uses 7440-57-5, Gold, uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses

RL: NUU (Other use, unclassified); USES (Uses)

(role of structure and chemical of support surface in zeolite membrane formation studied using metal and metal oxide-coated stainless steel)

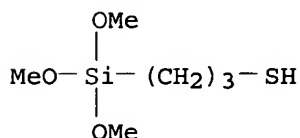
IT 4420-74-0, 3-Mercaptopropyl trimethoxysilane

RL: NUU (Other use, unclassified); USES (Uses)

(effects of surface functional groups on zeolite membrane formation studied by modifying stainless steel support with adsorbed surfactants)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:754526 HCAPLUS

DN 132:131217

TI Organic-functionalized molecular sieves (OFMSs): II. Synthesis, characterization and the transformation of OFMSs containing non-polar functional groups into solid acids

AU Jones, C. W.; Tsuji, K.; Davis, M. E.

CS Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA

SO Microporous and Mesoporous Materials (1999), 33(1-3), 223-240
CODEN: MIMMFJ; ISSN: 1387-1811

PB Elsevier Science B.V.

DT Journal

LA English

AB Organic-functionalized mol. sieves (OFMSs) with a beta-type structure (*BEA) containing intracryst. phenethyl (PE) groups were synthesized and characterized by x-ray diffraction, TGA, FT Raman spectroscopy, ²⁹Si, ¹³C and ²⁷Al solid-state NMR spectroscopy, XPS, bulk elemental anal., SEM and physisorption techniques. The OFMSs were synthesized from monomeric Si sources such as tetraethylorthosilicate and phenethyltrimethoxysilane and via the solid-state conversion of extracted, PE-functionalized MCM-41. Occluded structure-directing agent (tetraethylammonium fluoride; TEAF) is removed by solvent extraction techniques. By varying the extraction conditions,

OFMSs with varying hydrophobicity and porosity were synthesized. Bulk and surface elemental anal. indicate that there is an even distribution of organic functionalities throughout the material at levels of PE incorporation <5% (Si basis). The phenethyl groups are sulfonated using SO₃ vapor to produce a microporous solid containing intracryst. sulfonic acids.

CC 78-4 (Inorganic Chemicals and Reactions)

ST zeolite beta org functionalized prepn Raman; sulfonation phenethyl functionalized beta zeolite; phenethyl functionalized beta zeolite prepn

NMR Raman sulfonation; porosity phenethyl functionalized beta zeolite;
hydrophobicity phenethyl functionalized beta zeolite

IT NMR (nuclear magnetic resonance)
(multinuclear; of phenethyl functionalized beta zeolites)

IT Raman spectra
(of organic functionalized beta zeolites)

IT Porosity
Sulfonation
(of phenethyl functionalized beta zeolites)

IT Beta zeolites
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(organic functionalized; preparation and FT Raman spectra)

IT Zeolite MCM-41
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(phenethyl functionalized; for preparation of beta mol. sieves containing
non-polar functional groups)

IT Beta zeolites
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation); RACT (Reactant or reagent)
(phenethyl functionalized; preparation, multinuclear NMR and FT Raman
spectra, porosity, hydrophobicity and sulfonation of)

IT 78-10-4, Tetraethylorthosilicate 4420-74-0 57813-67-9
67592-36-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of organic functionalized beta zeolites)

IT 49539-88-0, Phenethyltrimethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of phenethyl functionalized beta zeolites)

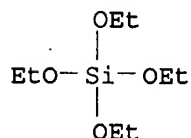
IT 8014-95-7, Oleum
RL: RCT (Reactant); RACT (Reactant or reagent)
(for sulfonation of organic functionalized beta zeolites)

IT 665-46-3, Tetraethylammonium fluoride
RL: NUU (Other use, unclassified); USES (Uses)
(template; for preparation of organic functionalized beta zeolites)

IT 78-10-4, Tetraethylorthosilicate 4420-74-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of organic functionalized beta zeolites)

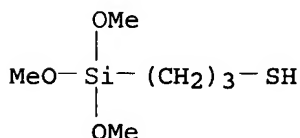
RN 78-10-4 HCAPLUS

CN Silicic acid (H₄SiO₄), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 21 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:446974 HCAPLUS
DN 131:178792
TI Organic-functionalized molecular sieves (OFMSs) I. Synthesis and
characterization of OFMSs with polar functional groups
AU Tsuji, Katsuyuki; Jones, Christopher W.; Davis, Mark E.
CS Chemical Engineering, California Institute of Technology, Pasadena, CA,
91125, USA
SO Microporous and Mesoporous Materials (1999), 29(3), 339-349
CODEN: MIMMFJ; ISSN: 1387-1811
PB Elsevier Science B.V.
DT Journal
LA English
AB Organic-functionalized mol. sieves that contain polar functional groups were
synthesized and characterized. Small, uniform-sized crystals with the BEA
topol. were obtained when Et4NF was used as a structure-directing agent
and added at the initiation of (EtO)4Si/organosilane hydrolysis. An
aminopropyl-functionalized material with the BEA topol. was prepared and
characterized by x-ray diffraction, solid-state NMR spectroscopy, Raman
spectroscopy and diffuse reflectance UV-visible spectroscopy. The
aminopropyl groups are located within the intracryst. void space and that
they can be reacted with aldehydes to form occluded imines.
CC 78-4 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75
ST beta zeolite org functionalized prepn; aldehyde reaction beta zeolite
aminopropyl functionalized; imine formation inclusion beta zeolite
aminopropyl functionalized
IT Beta zeolites
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(aminopropyl functionalized; preparation and reaction with aldehydes)
IT Beta zeolites
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(organic functionalized; preparation and reaction with aldehydes)
IT Imines
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of imines occluded in aminopropyl functionalized beta zeolites
from aldehydes)
IT Aldehydes, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with aminopropyl functionalized beta zeolites)
IT 78-10-4, Silicon tetraethoxide 13822-56-5,
Aminopropyltrimethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of aminopropyl functionalized beta
zeolites)
IT 2526-62-7, 2-Cyanoethyltrimethoxysilane 2530-86-1, 3-
(Dimethylamino)propyltrimethoxysilane 2551-83-9, Allyltrimethoxysilane
4420-74-0, 3-Mercaptopropyltrimethoxysilane 14867-28-8,
3-Iodopropyltrimethoxysilane 49539-88-0, Phenethyltrimethoxysilane
51826-90-5, 3-Bromopropyltrimethoxysilane 126519-89-9,
2-(4-Chlorosulfonylphenyl)ethyltrimethoxysilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of organic functionalized beta
zeolites)
IT 100-10-7, 4-(Dimethylamino)benzaldehyde 1971-81-9, 4-(Dimethylamino)-1-

naphthaldehyde

RL: RCT (Reactant); RACT (Reactant or reagent)

(reaction with aminopropyl functionalized beta zeolites with formation of occluded imines)

IT 665-46-3, Tetraethylammonium fluoride

RL: NUU (Other use, unclassified); USES (Uses)

(template for preparation of aminopropyl functionalized beta zeolites)

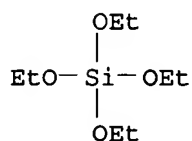
IT 78-10-4, Silicon tetraethoxide

RL: RCT (Reactant); RACT (Reactant or reagent)

(reactant for preparation of aminopropyl functionalized beta zeolites)

RN 78-10-4 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



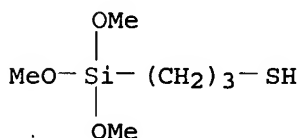
IT 4420-74-0, 3-Mercaptopropyltrimethoxysilane

RL: RCT (Reactant); RACT (Reactant or reagent)

(reactant for preparation of organic functionalized beta zeolites)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:544952 HCAPLUS

DN 129:285127

TI Covalent coupling of an organic chromophore into functionalized MCM-41 mesophases by template-directed co-condensation

AU Fowler, Christabel E.; Mann, Stephen; Lebeau, Benedicte

CS Department of Chemistry, University of Bath, Bath, BA2 7AY, UK

SO Chemical Communications (Cambridge) (1998), (17), 1825-1826

CODEN: CHCOFS; ISSN: 1359-7345

PB Royal Society of Chemistry

DT Journal

LA English

AB An ordered organo-SiO2-surfactant mesophase containing a covalently-linked chromophore was synthesized with MCM-41-type architecture by template-directed co-condensation of tetraethoxysilane and 3-(2,4-dinitrophenylamino)propyl(triethoxy)silane. A dye-functionalized mesoporous SiO2 with hexagonal order was produced by surfactant extraction of the as-synthesized material prepared under acidic conditions. The preparation

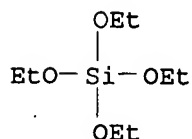
pH controlled the ability to obtain the mesophase product.

CC 78-4 (Inorganic Chemicals and Reactions)
 ST zeolite MCM41 dinitrophenylaminopropyltriethoxysilane chromophore bonded
 prepn; nitrophenylaminopropyltriethoxysilane chromophore zeolite MCM41
 bonded prepn; condensation direct synthesis zeolite
 dinitrophenylaminopropyltriethoxysilane chromophore; dye functionalized
 zeolite MCM41 direct synthesis; pH zeolite dinitrophenylaminopropyltrietho
 xysilane chromophore bonded prepn
 IT Zeolite MCM-41
 RL: SPN (Synthetic preparation); PREP (Preparation)
 ((dinitrophenylamino)propyl(triethoxy)silane compound; direct synthesis
 of mesoporous MCM-41 with covalently-linked organic dye)
 IT Bond
 (covalent; direct synthesis of mesoporous zeolite MCM-41 with
 covalently-linked organic dye)
 IT Dyes
 (direct synthesis of mesoporous zeolite MCM-41 with covalently-linked
 (dinitrophenylamino)propyl(triethoxy)silane)
 IT 57-09-0, Hexadecyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (for preparation of covalently-linked dye-functionalized
 zeolite MCM-41)
 IT 78-10-4, TEOS 133787-88-9
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (for preparation of covalently-linked dye-functionalized
 zeolite MCM-41)
 IT 133787-88-9DP, zeolite MCM-41 compound
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (for preparation of covalently-linked dye-functionalized zeolite MCM-41)
 IT 57-09-0, Hexadecyltrimethylammonium bromide
 RL: NUU (Other use, unclassified); USES (Uses)
 (for preparation of covalently-linked dye-functionalized
 zeolite MCM-41)
 RN 57-09-0 HCAPLUS
 CN 1-Hexadecanaminium, N,N,N-trimethyl-, bromide (9CI) (CA INDEX NAME)

$\text{Me}_3\text{N}^-(\text{CH}_2)_{15}-\text{Me}$

● Br^-

IT 78-10-4, TEOS
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (for preparation of covalently-linked dye-functionalized
 zeolite MCM-41)
 RN 78-10-4 HCAPLUS
 CN Silicic acid (H_4SiO_4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)



RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD

KATHLEEN FULLER EIC 1700 REMSON 4B28 571/272-2505

ALL CITATIONS AVAILABLE IN THE RE FORMAT

- L64 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:539320 HCAPLUS
 DN 129:277632
 TI Sulfonic acid bearing mesoporous materials as catalysts in furan and polyol derivatization
 AU Van Rhijn, W.; De Vos, D.; Bossaert, W.; Bullen, J.; Wouters, B.; Grobet, P.; Jacobs, P.
 CS Center for Surface Science and Catalysis, KULeuven, Heverlee, B-3001, Belg.
 SO Studies in Surface Science and Catalysis (1998), 117 (Mesoporous Molecular Sieves 1998), 183-190
 CODEN: SSCTDM; ISSN: 0167-2991
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Acid catalysts were obtained by incorporation of propanesulfonic acid groups into MCM [mesoporous crystalline material] and HMS siliceous mesoporous zeolite structures, with HS-(CH₂)₃-Si(OR')₃ as the building block. Synthesis routes were sol-gel processing of TEOS and HS-(CH₂)₃-Si(OMe)₃ in the presence of an ionic or neutral template, or silylation of a pre-synthesized MCM support. The surface modification with -(CH₂)₃-SO₃H was assessed with ¹³C-NMR, IR, sorption measurements and TGA. The materials were evaluated as catalysts in formation of 2,2-[bis-(5-methylfuryl)]propane by condensation of methylfuran (MF) and acetone. With propylsulfonic acid MCMs, furan oligomerization is largely circumvented and furan-based yields are increased from 40% (for H-β) to over 80%. In esterification of sorbitol with long fatty acids, zeolites are hardly active; however, at the hydrophobic surface of the propylsulfonic acid MCMs, both reactant phases are brought into intimate contact and this results in considerable catalytic activity.
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67
 ST mesoporous cryst siliceous material sulfonated catalyst; hydroxyalkylation condensation methylfuran acetone mesoporous catalyst; esterification sorbitol fatty acid mesoporous catalyst; zeolite mesoporous siliceous material catalyst
 IT Porous materials
 (mesoporous; sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)
 IT High-silica zeolites
 MCM zeolites
 RL: CAT (Catalyst use); USES (Uses)
 (propylsulfonated; sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)
 IT Alkylation catalysts
 Condensation reaction catalysts
 Esterification catalysts
 Hydroxylation catalysts
 Silylation
 Sol-gel processing
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)
 IT Siliceous materials
 RL: CAT (Catalyst use); USES (Uses)
 (sulfonic acid functionalized mesoporous zeolite catalysts in

condensation of furan and acetone and esterification of sorbitol with fatty acids)

IT Fatty acids, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)

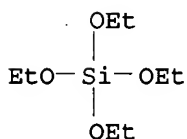
IT 28553-80-2D, Propanesulfonic acid, siliceous derivs.
 RL: CAT (Catalyst use); USES (Uses)
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)

IT 49555-48-8P, Isosorbide dilaurate 59212-75-8P, 2,2-[Bis-(5-methylfuryl)]propane
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)

IT 50-70-4, Sorbitol, reactions 67-64-1, Acetone, reactions 78-10-4, TEOS 110-00-9, Furan 143-07-7, Lauric acid, reactions 27137-41-3, Methylfuran
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)

IT 78-10-4, TEOS
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonic acid functionalized mesoporous zeolite catalysts in condensation of furan and acetone and esterification of sorbitol with fatty acids)

RN 78-10-4 HCAPLUS
 CN Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)

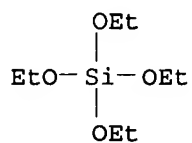


RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

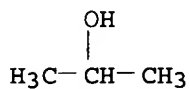
L64 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1993:176848 HCAPLUS
 DN 118:176848
 TI Method for functionalizing synthetic mesoporous crystalline material
 IN Beck, Jeffrey S.; Calabro, David C.; McCullen, Sharon B.; Pelrine, Bruce P.; Schmitt, Kirk D.; Vartuli, James C.
 PA Mobil Oil Corp., USA
 SO U.S., 15 pp. Cont.-in-part of U.S. 5,098,684.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 13

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 5145816	A	19920908	US 1991-718056	19910620
	US 5102643	A	19920407	US 1990-470008	19900125

US 5057296	A	19911015	US 1990-625171	19901210
US 5098684	A	19920324	US 1990-625245	19901210
EP 533312	A1	19930324	EP 1992-304525	19920519
EP 533312	B1	19980422		
R: BE, DE, DK, FR, GB, IT, NL, SE				
AU 9216396	A1	19921224	AU 1992-16396	19920520
AU 648166	B2	19940414		
CA 2069722	AA	19921221	CA 1992-2069722	19920527
CA 2069722	C	20021217		
US 5200058	A	19930406	US 1992-895283	19920608
KR 205979	B1	19990701	KR 1992-10496	19920617
JP 05254827	A2	19931005	JP 1992-160804	19920619
JP 3443428	B2	20030902		
US 5220101	A	19930615	US 1992-918322	19920722
US 5378440	A	19950103	US 1993-16402	19930211
PRAI US 1990-470008	A2	19900125		
US 1990-625171	A2	19901210		
US 1990-625245	A2	19901210		
US 1991-718056	A	19910620		
US 1992-918322	A2	19920722		
OS	MARPAT 118:176848			
AB	A method is described for modifying an ultra-large pore crystalline material by contacting with a treatment composition M'X'Y'n where M' is an element of Groups IIA, IVA, VA, VIA, IB, IIB, IVB, VB, or VIB; X' is halide, hydride, alkoxide of Cl-6, or acetate; Y' is X or phosphine, sulfide, carbonyl or cyano; and n = 1-5. The contacted crystalline material becomes functionalized. The functionalized material is also described and can be used as a sorbent or catalyst component.			
IC	ICM B01J029-04			
INCL	502060000			
CC	67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 35, 66			
ST	functionalized mesoporous cryst catalyst sorbent			
IT	Zeolites, uses RL: USES (Uses) (functionalization of catalysts and sorbents of)			
IT	Catalysts and Catalysis Sorbents (zeolite, functionalization of)			
IT	Polymerization catalysts (oligomerization, zeolite, functionalization of)			
IT	75-77-4, uses 78-10-4, Tetraethylorthosilicate 121-43-7, Trimethylborate 555-31-7, Aluminum isopropoxide 681-84-5, Tetramethylorthosilicate 872-05-9, 1-Decene 999-97-3, Hexamethyldisilazane 2269-22-9, Aluminum tri-sec-butoxide 3087-36-3, Titanium tetraethoxide 10103-47-6 13774-81-7, Ammonia-borane 14044-65-6, Borane-tetrahydrofuran 17593-70-3, Chromium acetate 55671-55-1 82887-05-6 147023-11-8 RL: USES (Uses) (functionalization of zeolites and sorbents by)			
IT	78-10-4, Tetraethylorthosilicate 555-31-7, Aluminum isopropoxide 681-84-5, Tetramethylorthosilicate 2269-22-9, Aluminum tri-sec-butoxide 3087-36-3, Titanium tetraethoxide RL: USES (Uses) (functionalization of zeolites and sorbents by)			
RN	78-10-4 HCAPLUS			
CN	Silicic acid (H4SiO4), tetraethyl ester (8CI, 9CI) (CA INDEX NAME)			

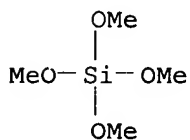


RN 555-31-7 HCAPLUS
CN 2-Propanol, aluminum salt (9CI) (CA INDEX NAME)

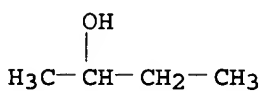


●1/3 Al

RN 681-84-5 HCAPLUS
CN Silicic acid (H₄SiO₄), tetramethyl ester (8CI, 9CI) (CA INDEX NAME)

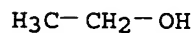


RN 2269-22-9 HCAPLUS
CN 2-Butanol, aluminum salt (9CI) (CA INDEX NAME)



●1/3 Al

RN 3087-36-3 HCAPLUS
CN Ethanol, titanium(4+) salt (9CI) (CA INDEX NAME)



●1/4 Ti(IV)

=>